# **Author Index**

Abrahamsen B., see Berg M.

Alabaster J.S.: An analysis of angling returns for trout, Salmo trutta L., in a Scottish river, 313

Avnimelech Y., Weber B., Hepher B., Milstein A. & Zorn M.: Studies in circulated fish ponds: organic matter recycling and nitrogen transformation, 231

Beard T.W., see Wickins J.F.

Beaumont W.R.C., Mills C.A. & Williams G.I.: Use of a microcomputer as an aid to identifying objects passing through a resistivity fish counter, 213

Berg M., Abrahamsen B. & Berg O.K.: Spawning of injured compared to uninjured female Atlantic salmon, Salmo salar L., 195

Berg O.K., see Berg M.

Biró P., see Véró M.

Broughton N.M., see Cowx I.G.

Bruno D.W.: Scottish experience with bacterial kidney disease in farmed salmonids between 1976 and 1985, 185

Bruylants B., Vandelannoote A. & Verheyen R.: The movement pattern and density distribution of perch, Perca fluviatilis L., in a channelized lowland

Capili J.B., see Macaranas J.M.

Claytor R.R., see MacCrimmon H.R.

Coutts R.R., see Ross L.G.

Cowx I.G., Fisher K.A.M. & Broughton N.M.: The use of anglers' catches to monitor fish populations in large water bodies, with particular reference to the River Derwent, Derbyshire, England, 95

De Silva S.S.: Reproductive biology of Oreochromis mossambicus populations of man-made lakes in Sri Lanka: a comparative study, 31

Devaraj K.V., Keshavappa G.Y. & Manissery J.K.: Growth of grass carp, Ctenopharyngodon idella Val., fed on two terrestrial fodder plants, 123

Dudley R.G. & Tampubolon G.: The artisanal seineand lift-net fisheries of the north coast of Java, 167

Ferguson A., see Taggart J.B.

Fish J.D., see Swales S

Fisher K.A.M. & Herrod R.G.: Use of a modified fish trap on an English reservoir, 327: see also Cowx I.G.

Flores Nava A., see Martinez Palacios C.A.

Golonka J.S., see Luczynski M.

Hasan M.R. & MacIntosh D.J.: Effect of chloride concentration on the acute toxicity of nitrite to common carp, Cyprinus carpio L., fry, 19

Heggberget T.G. & Heggberget T.M.: Behaviour of juvenile Atlantic salmon, Salmo salar L., in rapidand slow-flowing sections of a small Norwegian stream, 191

Heggberget T.M., see Heggberget T.G.

Hepher B., see Avnimelech Y.

Herrod R.G., see Fisher K.A.M.

Horváth L., Péteri A. & Kouril J.: Successful sterlet, Acipenser ruthenus L., propagation with synthetic LH-RH hormone, 113

Iqbal N.A.M. & Sommerville Christina.: Effects of Sanguinicola inermis Plehn, 1905 (Digenea: Sanguinicolidae) infection on growth performance and mortality in carp, Cyprinus carpio L., 117

Johnsen B.O. & Ugedal O.: Feeding by hatchery-reared and wild brown trout, Salmo trutta L., in a Norwegian stream, 281

Jones E., see Wickins J.F.

Keshavappa G.Y., see Devaraj K.B. Kouril J., see Horváth L.

Luczynski M., Zaporowski R.R. & Golonka J.S.. Rearing of European grayling, Thymallus thymallus L., larvae using dry and live food, 275

MacCrimmon H.R. & Claytor R.R.: Possible use of taxonomic characters to identify Newfoundland and Scottish stocks of Atlantic salmon, Salmo salar L., 1

MacIntosh D.J., see Hasan M.R.

McKinney R.W., see Ross L.G. Macaranas J.M., Taniguchi N., Pante M.J.R., Capili J.B. & Pullin R.S.V.: Electrophoretic evidence for extensive hybrid gene introgression into commercial Oreochromis niloticus (L.) stocks in the Philippines, 249

Mahon G.A.T., see Mills C.P.R. Manissery J.K., see Devaraj K.V

Martinez Palacios C.A., Flores Nava A. & Olvera Novoa M.A.: Use of a simple rubber stopper as a device for regulating water-flows in experimental recirculation systems, 227;

& Ross L.G.: The effects of temperature, body weight and hypoxia on the oxygen consumption of the Mexican mojarra, Cichlasoma urophthalmus

(Günther), 243

Mills C.P.R., Mahon G.A.T. & Piggins D.J.: Influence of stock levels, fishing effort and environmental factors on anglers' catches of Atlantic salmon, Salmo salar L., and sea trout, Salmo trutta L., 289; see also Beaumont W.R.C.

Milstein A., see Avnimelech Y.

Neophitou C.: Growth and population structure of brown trout, Salmo trutta fario L., in homeothermous stream conditions from a management point of view, 299

Ng L.T., see Wee K.L.

Olvera Novoa M.A., see Martinez Palacios C.A.

Pante M.J.R., see Macaranas J.M.

Paulovits G., see Véró M.

Pawson M.G.: Performance of rainbow trout, Salmo gairdneri Richardson, in a put-and-take fishery, and influence of anglers' behaviour on catchability,

Péteri A., see Horváth L. Piggins D.J., see Mills C.P.R.

Pullin R.S.V., see Macaranas J.M.

Rana K.J.: An evaluation of two types of containers for the artificial incubation of Oreochromis eggs, 139

Ross L.G., McKinney R.W. & Coutts R.R.: A comparison of haemoglobin and haematocrit levels in populations of rainbow trout, Salmo gairdneri Richardson, held at sea-level and high altitude,

see also Martinez Palacios C.A.

Sommerville Christina, see Iqbal N.A.M.

Swales S. & Fish J.D.: Angling catch returns as indicators of the status of upland trout lakes, 75

Taggart J.B. & Ferguson A.: Electrophoretic evaluation of a supplemental stocking programme for brown trout, Salmo trutta L., 155

Tampubolon G., see Dudley R.G. Taniguchi N., see Macaranas J.M.

Ugedal O., see Johnsen B.O.

Vandelannoote A., see Bruylants B.

Verheyen R., see Bruylants B.

Véró M., Paulovits G. & Biró P.: An improved grinding technique for examining fish otoliths for age and growth studies with special consideration of the eel, Anguilla anguilla L., 207

Vøllestad L.A.: Temperature-dependent activity of brackish water yellow eels, Anguilla anguilla L.

Weber B., see Avnimelech Y.

Wee K.L. & Ng L.T.: Use of cassava as an energy source in a pelleted feed for the tilapia, Oreochromis niloticus L., 129

Welcomme R.L.: The effects of the Sahelian drought on the fishery of the central delta of the Niger River,

Wickins J.F.: Stimulation of crusher claw development in cultured lobsters, Homarus gammarus (L.), 267; , Beard T.W. & Jones E.: Microtagging cultured lobsters, Homarus gammarus (L.), for stock enhancement trials, 259

Williams G.I., see Beaumont W.R.C.

Zaporowski R.R., see Luczynski M. Zorn M., see Avnimelech Y.

# **Subject Index**

Abramis brama L., see bream Acipenser ruthensis L., see sterlet Anguilla anguilla L., see eel

Bacterial kidney disease, in farmed salmonids, 185 Behaviour of juvenile Atlantic salmon, 191 Book reviews:

Ageing Manual for Kuwaiti Fish, by T.P. Williams, 334;

Artificial Reefs, Marine and Freshwater Applications, edited by Frank M. D'Itri, 163;

Business Management in Fisheries and Aquaculture, by Ian Chaston, 331;

Chemical and Biological Methods of Water Analysis for Aquaculturists, edited by Hadrian P. Stirling, 333;

Concepts in Marine Pollution Measurements, edited by H.H. White, 111;

Fish Energetics — New Perspectives, edited by P. Tytler & P. Calow, 111;

Freshwater Crayfish V. Papers from the Fifth International Symposium on Freshwater Crayfish, University of Davis, California, 1981, edited by Charles B. Goldman, 112:

Charles R. Goldman, 112; Freshwater Fish of Britain, Ireland and Europe, by R. Phillips & M. Rix, 164;

Introduction to the Practice of Fishery Science, by William F. Royce, 331;

Practical Manual for the Culture of the African Catfish (Clarias gariepinus), by W.J.A.R. Viveen, C.J.J. Richter, P.G.W.J. van Oordt, J.A.L. Janssen & E.A. Huisman, 333;

Seafarer's Guide to Marine Life, by Paul Horsman, 164;

The Behaviour of Teleost Fishes, edited by Tony J. Pitcher, 229;

The Biology and Management of the River Dee, edited by David Jenkins, 332;

The Fishing Culture of the World, edited by B. Gunda, 164;

The Lammas Drave and the Winter Herrin': a History of the Herring Fishing from East Fife, by Peter Smith, 165;

The Status of the Atlantic Salmon in Scotland, edited by David Jenkins & William Shearer, 331 Bream, population in River Derwent, 95

Carp (common), effect of sanguinicoliasis, 117; nitrite toxicity to, 19; (grass), growth of, 123

Cassava, as feed for tilapia, 129 Catchability, of rainbow trout, 59

Catch returns, analysis of trout in Scottish river, 313; as indicators of lake status, 75;

to monitor populations, 59

Cichlasoma urophthalmus (Günther), see mojarra
Chloride concentration, effect on nitrite toxicity to carp,

Chub, population in River Derwent, 96

Containers, for incubation, 139 Counter (resistivity), improved by microcomputer, 213 Ctenopharyngodon idella Val., see carp (grass) Cyprinus carpio L., see carp (common)

Dace, population in River Derwent, 95 Drought, effect on Niger delta fishery, 147 Drumstick, as fodder for grass carp, 123

Eels, temperature dependent activity of, 201; technique for examining otoliths of, 207

Egg diameter, of tilapia 31
Electrophoresis, in taxonomic studies of Atlantic salmon, 5;

to evaluate stocking programme for brown trout, 155;

to identify tilapia hybrids, 249

Fecundity, of tilapia in Sri Lanka, 31 Fertility, of sterlet eggs after LH-RH treatment, 115 Fodder plants, drumstick and lucerne for grass carp, 123 Food, utilization and conversion in carp, 117

Gonosomatic index, of tilapia, 31 Grayling (European), rearing larvae of, 275 Growth, in carp, 119; of brown trout, 299; in grass carp, 123;

Haematocrit, of rainbow trout at different altitudes, 105 Haemoglobin, of rainbow trout at different altitudes, 105

Homarus gammarus (L.), see lobster

Incubation, tilapia eggs, 139

in tilapia, 133

Kidney disease (bacterial), in farmed salmonids, 185

Leuciscus cephalus (L.), see chub Leuciscus leuciscus (L.), see dace LH-RH hormone (synthetic), in sterlet propagation, 113

Lift-net, fisheries in Java, 167
Lobster, microtagging of, 259;
stimulation of crusher claw development in, 267

Lucerne, as grass carp fodder, 123 Luliberine, see LH-RH hormones

Management, implications of drought on Niger delta fishery, 147;

of seine- and lift-net fisheries in Java, 181 Medicago sativa L., see lucerne

Meristic, characters to distinguish stocks of Atlantic salmon, 3

Mojarra (Mexican), oxygen consumption of, 243 Moringa pterygosperma, see drumstick

Morphometric characters, of tilapia, 34; to distinguish stocks of Atlantic salmon, 3

Mortality, in carp, 117

Nitrite, toxicity to common carp, 19 Nutrient utilization, of infected carp, 119 Nutritive values, cassava, 129; lucerne and drumstick, 125

Oreochromis mossambicus (Peters) see tilapia Oreochromis niloticus L., see tilapia Otoliths, grinding technique for examining, 207 Oxygen consumption, of Mexican mojarra, 243 Oyster spat, stimulation of crusher claw development in lobsters, 267

Parasites, of Sanguinicola inernis in carp, 117
Pelleted feed, for tilapia, 129
Perch, modified fish trap for, 327;
movement and distribution in channelized river, 49
Perca fluviatilis L., see perch
Ponds, recycling in, 231
Populations, brown trout in homeothermous stream,

coarse fish in River Derwent, 95; perch in Belgian river, 52; tilapia in Sri Lanka, 31; trout in Suffolk lake, 63 Protein efficiency rates, in infected carp, 117

Recirculation systems, device for regulating waterflows, 227

Regulating water-flows, in experimental recirculation systems, 227 Roach, population in River Derwent, 95

Salmon, Atlantic, behaviour of juveniles in small Norwegian stream, 191; distinguishing stocks by taxonomic characters, 1; factors influencing anglers' catches, 289:

factors influencing anglers' catches, 289; spawning of injured females, 195 Salmon counter, improved by microcomputer, 213 Salmo gairdneri Richardson, see trout, rainbow

Salmo salar L. see salmon, Atlantic Salmo trutta L. see trout, brown and sea Salmo trutta fario L., see trout, brown Sanguinicola inernis Plehn, 1905, in carp, 117

Seine-net, fisheries in Java, 167

Rutilus rutilus (L.), see roach

Sex ratio, tilapia, 31 Spawning, of injured Atlantic salmon, 195 Sterlet, propagation with LH-RH hormone, 113 Stocking evaluation, brown trout, 155

Tagging (micro-), of lobsters, 259; (ultrasonic), of juvenile Atlantic salmon, 191 Taxonomic characters, to distinguish stocks of Atlantic salmon, 1

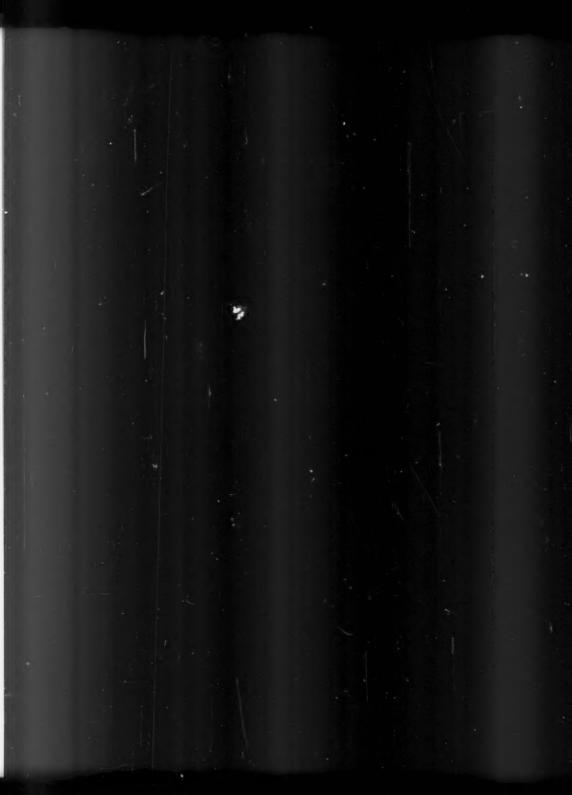
Thymallus thymallus L., see grayling (European)
Tilapia, cassava pelleted feed for, 129;
egg incubation of, 139;
hybrid genes in commercial stocks, 249;
recycling in circulated fish ponds, 231;
reproductive biology of, 31

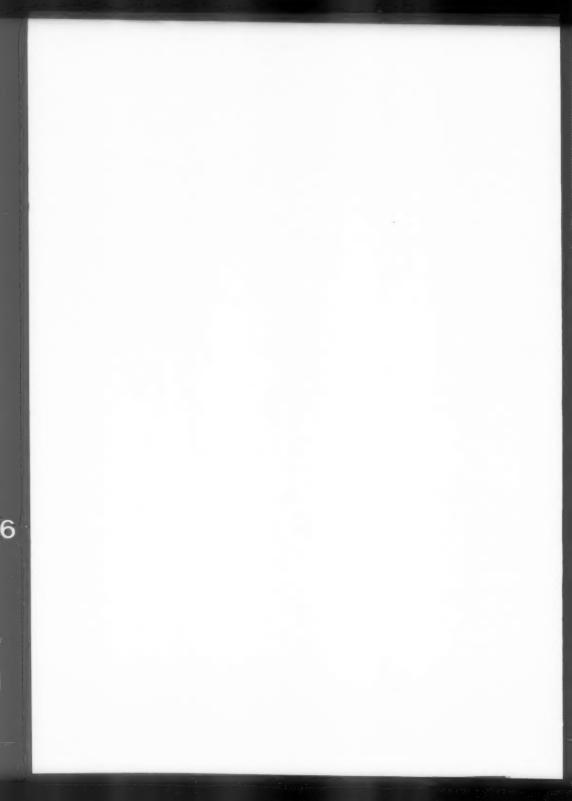
Toxicity, of nitrite to common carp, 19
Trap (fish), on English reservoir, 327
Trout, brown, analysis of angling returns, 313;
biomass in mid-Wales lakes, 79;
catch returns as indicators of lake status, 75;
evaluation of stocking, 155;
feeding in a Norwegian stream, 281;
growth and population structure, 299
Trout, rainbow, catchability of, 59;

growth of in Suffolk lake, 69; haemoglobin and haematocrit at different altitudes, 105 Trout, sea, factors influencing anglers' catches, 289

Ultrasonic tagging, of juvenile Atlantic salmon, 191

Water-flows, a device for regulating in experimental recirculation systems, 227





# **Aquaculture and Fisheries Management**

EDITORS
D. H. MILLS & R. J. ROBERTS

Volume 17

January-October 1986

**Volume Contents** 

**Blackwell Scientific Publications** 

OXFORD · LONDON · EDINBURGH BOSTON · PALO ALTO · MELBOURNE **Aquaculture and Fisheries Management** 

Formerly Fisheries Management, journal of the Institute of Fisheries Management

#### Editors

D. H. MILLS Department of Forestry and Natural Resources, University of Edinburgh, Scotland

R. J. ROBERTS Institute of Aquaculture, University of Stirling, Scotland

#### **Editorial Board**

J. A. BEARDMORE Swansea, Wales

S. S. DE SILVA Matara, Sri Lanka R. D. HALLER Mombasa, Kenya

J. E. HALVER Seattle, USA

B. HEPHER Hadera, Israel

L. HORVATH Százhalombatta. Hungary

E. A. HUISMAN Wageningen, The Netherlands

H. KAWANABE Kyoto, Japan

P. A. LARKIN Vancouver, Canada

R. S. J. LINFIELD Huntingdon. England

A. D. MCINTYRE Aberdeen, Scotland

J. F. MUIR Stirling, Scotland

R. S. V. PULLIN Manila, Philippines

Z. SHEHADEH Kuwait

I. R. SMITH Manila, Philippines

D. J. SOLOMON Lowestoft, England

J. STONEMAN London, England D. L. SUTTON Fort Lauderdale, USA

A. J. TACON FAO. Rome, Italy

J. E. THORPE Pitlochry, Scotland

R. L. WELCOMME FAO, Rome, Italy

Editorial policy. Aquaculture and Fisheries Management is an international Journal which publishes papers on: (1) practical or theoretical topics relevant to freshwater and marine aquaculture; (2) the conservation of freshwater and marine fish; and (3) the creation, development and management of commercial and recreational freshwater and marine fisheries in both temperate and tropical regions. Research papers, review articles and short communications will be accepted on the basis of their international context. On the decision of the editors, papers will be refereed by authorities in the relevant fields, including members of the Editorial Board. The Editors have final decision on publication.

Subscription rates. Aquaculture and Fisheries Management is published quarterly and the subscription price for 1986 is £63.00 (UK), £75.50 (overseas) and \$108.00 (USA and Canada) post free. The Journal is delivered to North America by accelerated surface post and subscribers there can expect to receive their copies within two weeks of British publication. Current issues for the Indian sub-continent, Australasia and the Far East are sent by air to regional distribution points from where they are forwarded to subscribers by surface mail. Any back numbers are normally despatched by surface to all regions, except North America, where they are sent by a.s.p., and India, where they are sent by air

Business correspondence. All matters relating to orders and subscriptions, back numbers and offprints should be sent to Blackwell Scientific Publications, PO Box 88, Oxford, England.

Advertisement bookings. Enquiries should be sent to the Advertisement Manager, Blackwell Scientific Publications, Osney Mead, Oxford OX2 0EL, England (telephone 0865 240201).

© 1986 Blackwell Scientific Publications Ltd. Published by Blackwell Scientific Publications Ltd. Osney Mead, Oxford OX2 0EL, England. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Blackwell Scientific Publications Ltd for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the stated fee of \$02.00 per copy is paid directly to CCC, 27 Congress Street, Salem, MA 01970, USA. 0266-996X/86 \$02.00.

# CONTENTS

# Volume 17, Number 1 January 1986

- 1 Possible use of taxonomic characters to identify Newfoundland and Scottish stocks of Atlantic salmon, Salmo salar L.
  H. R. MacCRIMMON AND R. R. CLAYTOR
- 19 Effect of chloride concentration on the acute toxicity of nitrite to common carp, Cyprinus carpio L., fry M. R. HASAN AND D. J. MACINTOSH
- 31 Reproductive biology of *Oreochromis mossambicus* populations of man-made lakes in Sri Lanka: a comparative study
  S. S. DE SILVA
- 49 The movement pattern and density distribution of perch, Perca fluviatilis L., in a channelized lowland river
  B. BRUYLANTS, A. VANDELANNOOTE AND R. VERHEYEN
- 59 Performance of rainbow trout, Salmo gairdneri Richardson, in a put-and-take fishery, and influence of anglers' behaviour on catchability
  M. G. PAWSON
- 75 Angling catch returns as indicators of the status of upland trout lakes S. SWALES AND J. D. FISH
- 95 The use of anglers' catches to monitor fish populations in large water bodies, with particular reference to the River Derwent, Derbyshire, England I. G. COWX, K. A. M. FISHER AND N. M. BROUGHTON

#### **Short Communication**

- A comparison of haemoglobin and haematocrit levels in populations of rainbow trout, Salmo gairdneri Richardson, held at sea-level and high altitude L. G. ROSS, R. W. McKINNEY AND R. R. COUTTS
- 111 Book Reviews

## Volume 17, Number 2 April 1986

- 113 Successful sterlet, Acipenser ruthenus L., propagation with synthetic LH-RH hormone L. HORVÁTH, A. PÉTERI AND J. KOURIL
- 117 Effects of Sanguinicola inermis Plehn, 1905 (Digenea: Sanguinicolidae) infection on growth performance and mortality in carp, Cyprinus carpio L. N. A. M. IQBAL AND CHRISTINA SOMMERVILLE
- 123 Growth of grass carp, Ctenopharyngodon idella Val., fed on two terrestrial fodder plants K. V. DEVARAJ, G. Y. KESHAVAPPA AND J. K. MANISSERY
- 129 Use of cassava as an energy source in a pelleted feed for the tilapia, *Oreochromis niloticus* L.K. L. WEE AND L. T. NG
- An evaluation of two types of containers for the artificial incubation of *Oreochromis* eggs
  K. J. RANA
- 147 The effects of the Sahelian drought on the fishery of the central delta of the Niger River R. L. WELCOMME
- 155 Electrophoretic evaluation of a supplemental stocking programme for brown trout, Salmo trutta L.
  J. B. TAGGART AND A. FERGUSON
- 163 Book Reviews

# Volume 17, Number 3 July 1986

- 167 The artisanal seine- and lift-net fisheries of the north coast of Java R. G. DUDLEY AND G. TAMPUBOLON
- Scottish experience with bacterial kidney disease in farmed salmonids between 1976 and 1985
   D. W. BRUNO
- 191 Behaviour of juvenile Atlantic salmon, Salmo salar L., in rapid- and slow-flowing sections of a small Norwegian stream T. G. HEGGBERGET AND T. M. HEGGBERGET
- 195 Spawning of injured compared to uninjured female Atlantic salmon, Salmo salar L. M. BERG, B. ABRAHAMSEN AND O. K. BERG
- 201 Temperature-dependent activity of brackish water yellow eels, Anguilla anguilla L. L. A. VØLLESTAD
- 207 An improved grinding technique for examining fish otoliths for age and growth studies with special consideration of the eel, Anguilla anguilla L.
  M. VÉRÓ, G. PAULOVITS AND P. BIRÓ
- 213 Use of a microcomputer as an aid to identifying objects passing through a resistivity fish counter
  W. R. C. BEAUMONT, C. A. MILLS AND G. I. WILLIAMS

#### **Short Communication**

- 227 Use of a simple rubber stopper as a device for regulating water-flows in experimental recirculation systems
  C. A. MARTINEZ PALACIOS, A. FLORES NAVA AND M. A. OLVERA NOVOA
- 229 Book Review

### Volume 17, Number 4 October 1986

- 231 Studies in circulated fish ponds: organic matter recycling and nitrogen transformation Y. AVNIMELECH, B. WEBER, B. HEPHER, A. MILSTEIN AND M. ZORN
- 243 The effects of temperature, body weight and hypoxia on the oxygen consumption of the Mexican mojarra, Cichlasoma urophthalmus (Günther)
  C. A. MARTINEZ PALACIOS AND L. G. ROSS
- 249 Electrophoretic evidence for extensive hybrid gene introgression into commercial Oreochromis niloticus (L.) stocks in the Philippines
  J. M. MACARANAS, N. TANIGUCHI, M. J. R. PANTE, J. B. CAPILI AND R. S. V. PULLIN
- 259 Microtagging cultured lobsters, Homarus gammarus (L.), for stock enhancement trials J. F. WICKINS, T. W. BEARD AND E. JONES
- 267 Stimulation of crusher claw development in cultured lobsters, Homarus gammarus (L.) J. F. WICKINS
- 275 Rearing of European grayling, Thymallus thymallus L., larvae using dry and live food M. LUCZYNSKI, R. R. ZAPOROWSKI AND J. S. GOLONKA
- 281 Feeding by hatchery-reared and wild brown trout, Salmo trutta L., in a Norwegian stream
  B. O. JOHNSEN AND O. UGEDAL
- Influence of stock levels, fishing effort and environmental factors on anglers' catches of Atlantic salmon, Salmo salar L., and sea trout, Salmo trutta L.
   C. P. R. MILLS, G. A. T. MAHON AND D. J. PIGGINS
- 299 Growth and population structure of brown trout, Salmo trutta fario L., in homeothermous stream conditions from a management point of view C. NEOPHITOU
- 313 An analysis of angling returns for trout, Salmo trutta L., in a Scottish river J. S. ALABASTER

#### **Short Communication**

- 327 Use of a modified fish trap on an English reservoir K. A. M. FISHER AND R. G. HERROD
- 331 Book Reviews
- 334 Forthcoming Conference
- 335 Author Index
- 337 Subject Index

